

## **Abstract**

Importins are proteins from a group of karyopherins, which provide transport of proteins into the nucleus both in somatic cells and gametes. Transport of specific transcription factors plays an important role in gametes and affects key events of reproduction. In mammals, reproduction is mediated by the process of sexual reproduction. In this event, a haploid gamete is formed in each parent, which in later stages of fertilization combine and make a diploid zygote. Gene expression in gametes differs dramatically from somatic cells. In gametes, translation is suspended and specific proteins are expressed only at certain stages of cell development. Proteins determined for transport into the nucleus contain various nuclear localization signals, which are detected by different types of importins. Based on studying differences in expression of individual types of importins in various phases of gametogenesis, we can deduce their roles in these processes. Role of importins was proven in gametogenesis, differentiation of stem cells and maturation of germ cells. On top of that, importins appear to play a role in defense of male germ cells against oxidative stress.